

SEQUENCE LISTING

<110> PRESIDENT AND FELLOWS OF HARVARD COLLEGE, et al.

<120> METHODS FOR MODULATING AN IMMUNE
RESPONSE BY MODULATING KRC ACTIVITY

<130> HUI-045CP2PC

<150> 10/701,401

<151> 2003-11-03

<160> 8

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 8546

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (889) ... (8106)

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 aaatctctga cacatcttga ccatgagacc acggctgggt tttggcagga ttcgaggcac 180
 aaacccagca gcctcaacct agttcatgga ggagcctcgc ggggtccctgg ccaagcaagc 240
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 tgaatgctgg ctttcagaga gaacagcgtt tcagtttgg tcatcgaaag tggtgcccttc 360
 agcacagaag aagagcgtga tttctccctcc aaggccgttg atctccaaacc cagaactaaa 420
 ggggagaaga gccaccccca gcatccagcg tggcatctt tggccagga ccagggatga 480
 ctggggccatg gacacagatg tctccaaacct tcaaccgtt gcatagcaca cgggggactc 540
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 gacgtttcc cgacagacat tcaggcagaa agtgcgtggc cgtttctgt ctgcaaagta 660
 gagggccatc gctcaccaat agaatagcgt gggccctgtat gacctgcgtcc gagtccactc 720
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 ttgaccaatg tggccaaagc tggacacccctc cttggacac tgggattatt cataaatgca 840
 gccccccctg actctccctg aatagcatct tgaagggtc atg gat cct 897

Met Asp Pro

1

gaa caa agt gtc aag ggc acc aag aag gct gag gga agt ccc cgg aag 945
 Glu Gln Ser Val Lys Gly Thr Lys Lys Ala Glu Gly Ser Pro Arg Lys
 5 10 15

cggtctgaccaaa gga gag gcc att cag acc agt gtt tct tcc agc gtc 993
 Arg Leu Thr Lys Gly Glu Ala Ile Gln Thr Ser Val Ser Ser Ser Val
 20 25 30 35

ccataccatccggc agc ggc aca gct ccg acc caa gag agc ccc gcc caa 1041
 Pro Tyr Pro Gly Ser Gly Thr Ala Pro Thr Gln Glu Ser Pro Ala Gln
 40 45 50

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|---|------|
| gag ctc tta gcc ccg cag ccc ttc ccg ggc ccc tca tca gtt ctt agg | 1089 |
| Glu Leu Leu Ala Pro Gln Pro Phe Pro Gly Pro Ser Ser Val Leu Arg | |
| 55 60 65 | |
| gaa ggc tct cag gag aaa acg ggc cag cag cag aag ccc ccc aaa agg | 1137 |
| Glu Gly Ser Gln Glu Lys Thr Gly Gln Gln Lys Pro Pro Lys Arg | |
| 70 75 80 | |
| ccc ccc atc gaa gca tcc gtc cac atc tca cac gtt ccg cag cac cct | 1185 |
| Pro Pro Ile Glu Ala Ser Val His Ile Ser His Val Pro Gln His Pro | |
| 85 90 95 | |
| ctg aca cca gca ttc atg tcg cct ggc aaa cct gag cat ctc ctg gag | 1233 |
| Leu Thr Pro Ala Phe Met Ser Pro Gly Lys Pro Glu His Leu Leu Glu | |
| 100 105 110 115 | |
| ggg tcc aca tgg caa ctg gtt agc ccc atg aga ctc gga ccc tct ggc | 1281 |
| Gly Ser Thr Trp Gln Leu Val Ser Pro Met Arg Leu Gly Pro Ser Gly | |
| 120 125 130 | |
| tcc ttg ctg gcc cct ggg ctc cat cct cag agc cag ctc ctt cct tcc | 1329 |
| Ser Leu Leu Ala Pro Gly Leu His Pro Gln Ser Gln Leu Leu Pro Ser | |
| 135 140 145 | |
| cac gct tcc atc att ccc ccc gag gac ctt cct gga gtc ccc aaa gtc | 1377 |
| His Ala Ser Ile Ile Pro Pro Glu Asp Leu Pro Gly Val Pro Lys Val | |
| 150 155 160 | |
| ttc gtg cct cgt cct tcc cag gtc tcc ttg aag ccc aca gaa gag gca | 1425 |
| Phe Val Pro Arg Pro Ser Gln Val Ser Leu Lys Pro Thr Glu Glu Ala | |
| 165 170 175 | |
| cac aag aag gag agg aag ccc cag aag cca ggc aag tac atc tgc cag | 1473 |
| His Lys Lys Glu Arg Lys Pro Gln Lys Pro Gly Lys Tyr Ile Cys Gln | |
| 180 185 190 195 | |
| tac tgc agc cgg ccc tgt gcc aag ccc agc gtg ctc cag aag cac att | 1521 |
| Tyr Cys Ser Arg Pro Cys Ala Lys Pro Ser Val Leu Gln Lys His Ile | |
| 200 205 210 | |
| cgc tca cac aca ggt gag agg ccc tac ccc tgc ggc ccc tgt ggc ttc | 1569 |
| Arg Ser His Thr Gly Glu Arg Pro Tyr Pro Cys Gly Pro Cys Gly Phe | |
| 215 220 225 | |
| tcc ttc aag acc aag agt aat ctc tac aag cac agg aag tcc cat gcc | 1617 |
| Ser Phe Lys Thr Lys Ser Asn Leu Tyr Lys His Arg Lys Ser His Ala | |
| 230 235 240 | |
| cac cgc atc aaa gca ggc ctg gcc tca ggc atg ggt ggc gag atg tac | 1665 |
| His Arg Ile Lys Ala Gly Leu Ala Ser Gly Met Gly Gly Glu Met Tyr | |
| 245 250 255 | |
| cca cat ggg ctg gag atg gag cgg atc cct ggg gaa gag ttt gag gag | 1713 |
| Pro His Gly Leu Glu Met Glu Arg Ile Pro Gly Glu Glu Phe Glu Glu | |
| 260 265 270 275 | |
| ccc act gag gga gaa agc aca gat tct gaa gag gag act agt gcc acc | 1761 |
| Pro Thr Glu Gly Glu Ser Thr Asp Ser Glu Glu Glu Thr Ser Ala Thr | |
| 280 285 290 | |

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|--|------|
| tct ggt cac cct gca gag ctc tcc cca aga ccc aag cag ccc ctt ctc | 1809 |
| Ser Gly His Pro Ala Glu Leu Ser Pro Arg Pro Lys Gln Pro Leu Leu | |
| 295 300 305 | |
| tcc agc ggg cta tac agc tct ggg agc cac agt tcc agc cac gaa cgc | 1857 |
| Ser Ser Gly Leu Tyr Ser Ser Gly Ser His Ser Ser His Glu Arg | |
| 310 315 320 | |
| tgt tcc ctg tcc cag tcc agc aca gcc cag tca ctc gaa gac ccc cct | 1905 |
| Cys Ser Leu Ser Gln Ser Ser Thr Ala Gln Ser Leu Glu Asp Pro Pro | |
| 325 330 335 | |
| cca ttt gtg gaa ccc tca tct gag cac ccc ctg agc cat aaa cct gaa | 1953 |
| Pro Phe Val Glu Pro Ser Ser Glu His Pro Leu Ser His Lys Pro Glu | |
| 340 345 350 355 | |
| gac acc cac acg att aag cag aag ctg gcc ctc cgc tta agc gag agg | 2001 |
| Asp Thr His Thr Ile Lys Gln Lys Leu Ala Leu Arg Leu Ser Glu Arg | |
| 360 365 370 | |
| aag aag gtg atc gat gag cag gcg ttt ctg agc cca ggc agc aaa ggg | 2049 |
| Lys Lys Val Ile Asp Glu Gln Ala Phe Leu Ser Pro Gly Ser Lys Gly | |
| 375 380 385 | |
| agt act gag tct ggg tat ttc tct cgc tcc gag agt gca gag cag cag | 2097 |
| Ser Thr Glu Ser Gly Tyr Phe Ser Arg Ser Glu Ser Ala Glu Gln Gln | |
| 390 395 400 | |
| gtc agc ccc cca aac acc aac, gcc aag tcc tac gct gag atc atc ttt | 2145 |
| Val Ser Pro Pro Asn Thr Asn Ala Lys Ser Tyr Ala Glu Ile Ile Phe | |
| 405 410 415 | |
| ggc aag tgt ggg cga ata gga cag cgg acc gcc atg ctg aca gcc acc | 2193 |
| Gly Lys Cys Gly Arg Ile Gly Gln Arg Thr Ala Met Leu Thr Ala Thr | |
| 420 425 430 435 | |
| tcc acc cag ccc ctc ctg ccc ctc tcc acc gaa gac aag ccc agc ctg | 2241 |
| Ser Thr Gln Pro Leu Leu Pro Leu Ser Thr Glu Asp Lys Pro Ser Leu | |
| 440 445 450 | |
| gtg cct ttg tct gta ccc cgg acg cag gtg atc gag cac atc acg aag | 2289 |
| Val Pro Leu Ser Val Pro Arg Thr Gln Val Ile Glu His Ile Thr Lys | |
| 455 460 465 | |
| ctc atc acc atc aac gag gcc gtg gtg gac acc agt gag atc gac agc | 2337 |
| Leu Ile Thr Ile Asn Glu Ala Val Val Asp Thr Ser Glu Ile Asp Ser | |
| 470 475 480 | |
| gtg aag cca agg cgg agc tca ctg tcc agg cgc agc agc atg gag tcc | 2385 |
| Val Lys Pro Arg Arg Ser Ser Leu Ser Arg Arg Ser Ser Met Glu Ser | |
| 485 490 495 | |
| cca aaa tcc agc ctc tac cgg gag ccc ctg tca tcc cac agt gag aaa | 2433 |
| Pro Lys Ser Ser Leu Tyr Arg Glu Pro Leu Ser Ser His Ser Glu Lys | |
| 500 505 510 515 | |
| acc aag cct gaa caa tca ctg ctg agc ctc cag cac ccg ccc agt acc | 2481 |
| Thr Lys Pro Glu Gln Ser Leu Leu Ser Leu Gln His Pro Pro Ser Thr | |
| 520 525 530 | |

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|---|------|
| gcc ccc cct gtg cct ctc ctg aga agc cac tca atg cct tct gcc gcc | 2529 |
| Ala Pro Pro Val Pro Leu Leu Arg Ser His Ser Met Pro Ser Ala Ala | |
| 535 540 545 | |
| tgc act atc agc acc ccc cac cac ccc ttc cga ggt agc tac tcc ttc | 2577 |
| Cys Thr Ile Ser Thr Pro His His Pro Phe Arg Gly Ser Tyr Ser Phe | |
| 550 555 560 | |
| gat gac cat atc acc gac tcc gaa gcc ctg agc cgc agc agt cac gtg | 2625 |
| Asp Asp His Ile Thr Asp Ser Glu Ala Leu Ser Arg Ser Ser His Val | |
| 565 570 575 | |
| ttt acc tcc cac ccc cgg atg ctg aag ccg cag ccg gca atc gaa tta | 2673 |
| Phe Thr Ser His Pro Arg Met Leu Lys Pro Gln Pro Ala Ile Glu Leu | |
| 580 585 590 595 | |
| cct ttg gga ggg gaa tac agt tct gag gag cct ggc cca agc agc aaa | 2721 |
| Pro Leu Gly Gly Glu Tyr Ser Ser Glu Glu Pro Gly Pro Ser Ser Lys | |
| 600 605 610 | |
| gac aca gcc tcc aag ccc tcg gac gaa gtg gaa ccc aag gaa agc gag | 2769 |
| Asp Thr Ala Ser Lys Pro Ser Asp Glu Val Glu Pro Lys Glu Ser Glu | |
| 615 620 625 | |
| ctt acc aaa aag acc aag aag ggt ttg aaa aca aaa ggg gtg atc tac | 2817 |
| Leu Thr Lys Lys Thr Lys Gly Leu Lys Thr Lys Gly Val Ile Tyr | |
| 630 635 640 | |
| gaa tgt aac ata tgt ggt gct cgg tac aag aaa agg gat aac tac gaa | 2865 |
| Glu Cys Asn Ile Cys Gly Ala Arg Tyr Lys Lys Arg Asp Asn Tyr Glu | |
| 645 650 655 | |
| gcc cac aaa aaa tac tac tgc tca gag ctt cag atc gca aag ccc atc | 2913 |
| Ala His Lys Lys Tyr Tyr Cys Ser Glu Leu Gln Ile Ala Lys Pro Ile | |
| 660 665 670 675 | |
| tct gca ggc acc cac aca tct cca gaa gct gaa aag agt cag att gag | 2961 |
| Ser Ala Gly Thr His Thr Ser Pro Glu Ala Glu Lys Ser Gln Ile Glu | |
| 680 685 690 | |
| cat gag ccg tgg tcc caa atg atg cat tac aaa ctg gga acc acc ctg | 3009 |
| His Glu Pro Trp Ser Gln Met Met His Tyr Lys Leu Gly Thr Thr Leu | |
| 695 700 705 | |
| gaa ctc act cca ctg agg aag agg agg aaa gag aag agc ctt ggg gac | 3057 |
| Glu Leu Thr Pro Leu Arg Lys Arg Arg Lys Glu Lys Ser Leu Gly Asp | |
| 710 715 720 | |
| gag gaa gag cca cct gcc ttt gag tcc aca aaa agt cag ttt ggc agc | 3105 |
| Glu Glu Pro Pro Ala Phe Glu Ser Thr Lys Ser Gln Phe Gly Ser | |
| 725 730 735 | |
| ccc ggg cca tct gat gct gct cgg aac ctt ccc ctg gag tcc acc aag | 3153 |
| Pro Gly Pro Ser Asp Ala Ala Arg Asn Leu Pro Leu Glu Ser Thr Lys | |
| 740 745 750 755 | |
| tca cca gca gaa cca agt aaa tca gtg ccc tcc ttg gag gga ccc acg | 3201 |
| Ser Pro Ala Glu Pro Ser Lys Ser Val Pro Ser Leu Glu Gly Pro Thr | |
| 760 765 770 | |

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|--|------|
| ggc ttc cag cca agg act ccc aag cca ggg tcc ggt tca gaa tca ggg Gly Phe Gln Pro Arg Thr Pro Lys Pro Gly Ser Gly Ser Glu Ser Gly 775 780 785 | 3249 |
| aag gag agg aga aca acg tcc aaa gaa att tct gtc atc cag cac acc Lys Glu Arg Arg Thr Thr Ser Lys Glu Ile Ser Val Ile Gln His Thr 790 795 800 | 3297 |
| agc tcc ttt gag aaa tct gat tct ctc gag cag ccg agt ggc ttg gaa Ser Ser Phe Glu Lys Ser Asp Ser Leu Glu Gln Pro Ser Gly Leu Glu 805 810 815 | 3345 |
| ggg gaa gac aaa cct ctg gcc cag ttc cca tca ccc cca cct gcc cca Gly Glu Asp Lys Pro Leu Ala Gln Phe Pro Ser Pro Pro Pro Ala Pro 820 825 830 835 | 3393 |
| cac gga cgc tct gct cac tcc ctg cag cct aag ttg gtc cgc cag ccc His Gly Arg Ser Ala His Ser Leu Gln Pro Lys Leu Val Arg Gln Pro 840 845 850 | 3441 |
| aac att cag gtt cct gag atc cta gta act gag gag cct gac cgg ccg Asn Ile Gln Val Pro Glu Ile Leu Val Thr Glu Glu Pro Asp Arg Pro 855 860 865 | 3489 |
| gac aca gag cca gag ccg ccc cct aag gaa cct gag aag act gag gag Asp Thr Glu Pro Glu Pro Pro Lys Glu Pro Glu Lys Thr Glu Glu 870 875 880 | 3537 |
| tcc caa tgg ccc cag cgc agc cag aca ctt gcc cag ctc cca gct gag Phe Gln Trp Pro Gln Arg Ser Gln Thr Leu Ala Gln Leu Pro Ala Glu 885 890 895 | 3585 |
| aag gct cca ccc aaa aag aag agg ttg cgc ctg gca gag atg gcc caa Lys Ala Pro Pro Lys Lys Arg Leu Arg Leu Ala Glu Met Ala Gln 900 905 910 915 | 3633 |
| tca tca ggg gag tcc agc ttc gag tcc tct gtg cct ctg tct cgc agc Ser Ser Gly Ser Ser Phe Glu Ser Ser Val Pro Leu Ser Arg Ser 920 925 930 | 3681 |
| ccg agc cag gaa agc aat gtc tct ttg agt ggg tcc agc cgc tca gcc Pro Ser Gln Glu Ser Asn Val Ser Leu Ser Gly Ser Ser Arg Ser Ala 935 940 945 | 3729 |
| tcg ttt gag agg gat gac cat ggg aaa gcc gag gcc ccc gat ccc tca Ser Phe Glu Arg Asp Asp His Gly Lys Ala Glu Ala Pro Asp Pro Ser 950 955 960 | 3777 |
| tct gac atg cgc ccc aaa ccc ctg ggc acc cac atg ttg act gtc ccc Ser Asp Met Arg Pro Lys Pro Leu Gly Thr His Met Leu Thr Val Pro 965 970 975 | 3825 |
| agc cac cac cca cat gcc cga gag atg cgg agg tca gcc tca gag cag Ser His His Pro His Ala Arg Glu Met Arg Arg Ser Ala Ser Glu Gln 980 985 990 995 | 3873 |
| agc ccc aac gtt tcc cat tct gcc cac atg acc cac atg ttg act gtc ccc Ser Pro Asn Val Ser His Ser Ala His Met Thr Glu Thr Arg Ser Lys 1000 1005 1010 | 3921 |

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|---|------|
| tcc ttt gac tat ggc agc ttg tcc ttg aca ggc cct tct gct cca gcc | 3969 |
| Ser Phe Asp Tyr Gly Ser Leu Ser Leu Thr Gly Pro Ser Ala Pro Ala | |
| 1015 1020 1025 | |
| cca gtg gct cca cca gcc ggg gag gcc ccg cca gag aga aga aaa tgc | 4017 |
| Pro Val Ala Pro Pro Ala Gly Glu Ala Pro Pro Glu Arg Arg Lys Cys | |
| 1030 1035 1040 | |
| ttc ttg gtg aga agc ccc tct ctg agc agg cct cca gaa tct gag ttg | 4065 |
| Phe Leu Val Arg Ser Pro Ser Leu Ser Arg Pro Pro Glu Ser Glu Leu | |
| 1045 1050 1055 | |
| gag gtt gcc ccc aag gga aga cag gag agc gaa gaa cca cag ccc tca | 4113 |
| Glu Val Ala Pro Lys Gly Arg Gln Glu Ser Glu Glu Pro Gln Pro Ser | |
| 1060 1065 1070 1075 | |
| tcc agt aaa ccc tct gcc aaa agc tca ttg tcc cag att tcc tct gcg | 4161 |
| Ser Ser Lys Pro Ser Ala Lys Ser Ser Leu Ser Gln Ile Ser Ser Ala | |
| 1080 1085 1090 | |
| gcc acc tca cat ggt gga ccc ccg gga ggc aag ggc cca ggg cag gac | 4209 |
| Ala Thr Ser His Gly Gly Pro Pro Gly Gly Lys Gly Pro Gly Gln Asp | |
| 1095 1100 1105 | |
| agg ccc gca ttg ggg ccc act gtg ccc tac aca gaa gca ctg caa gtg | 4257 |
| Arg Pro Ala Leu Gly Pro Thr Val Pro Tyr Thr Glu Ala Leu Gln Val | |
| 1110 1115 1120 | |
| ttc cac cac ccc gtt gcc cag aca ccc ctg cat gag aag cca tac ctg | 4305 |
| Phe His His Pro Val Ala Gln Thr Pro Leu His Glu Lys Pro Tyr Leu | |
| 1125 1130 1135 | |
| ccc cca cca gtc tcc ctt ttc tcc cag cat ctc gtg cag cat gag | 4353 |
| Pro Pro Pro Val Ser Leu Phe Ser Phe Gln His Leu Val Gln His Glu | |
| 1140 1145 1150 1155 | |
| cca gga cag tct cca gaa ttc ttc acc cag gcc atg tcc agc ctc | 4401 |
| Pro Gly Gln Ser Pro Glu Phe Phe Ser Thr Gln Ala Met Ser Ser Leu | |
| 1160 1165 1170 | |
| ctg tcc tca cca tac tcc atg ccc cca ctt cct ccc tcc tta ttt caa | 4449 |
| Leu Ser Ser Pro Tyr Ser Met Pro Pro Leu Pro Pro Ser Leu Phe Gln | |
| 1175 1180 1185 | |
| gcc cca ccg ctt ctc cag cct act gtt ctg cac cca ggc caa ctc | 4497 |
| Ala Pro Pro Leu Pro Leu Gln Pro Thr Val Leu His Pro Gly Gln Leu | |
| 1190 1195 1200 | |
| cat ctc ccc cag ctc atg cct cac cca gcc aac atc ccc ttc agg caa | 4545 |
| His Leu Pro Gln Leu Met Pro His Pro Ala Asn Ile Pro Phe Arg Gln | |
| 1205 1210 1215 | |
| ccc cct tcc ttc ctc ccc atg cca tac ccg acc tcc tca gca ctg tct | 4593 |
| Pro Pro Ser Phe Leu Pro Met Pro Tyr Pro Thr Ser Ser Ala Leu Ser | |
| 1220 1225 1230 1235 | |
| tct ggg ttt ttc ctc ctg cct ctc cag ttt gca ctt cag ctc cct | 4641 |
| Ser Gly Phe Phe Leu Pro Leu Gln Ser Gln Phe Ala Leu Gln Leu Pro | |
| 1240 1245 1250 | |

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|---|------|
| ggt gat gtg gaa agc cat ctg ccc cag atc aaa acc acc agc ctg gcc cca | 4689 |
| Gly Asp Val Glu Ser His Leu Pro Gln Ile Lys Thr Ser Leu Ala Pro | |
| 1255 1260 1265 | |
| ctg gca aca gga agt gct ggc ctc tcc ccc agc caa gag tac agc agt | 4737 |
| Leu Ala Thr Gly Ser Ala Gly Leu Ser Pro Ser Gln Glu Tyr Ser Ser | |
| 1270 1275 1280 | |
| gac atc cgg cta ccc cct gtg gct ccc cca gcc agc tcc tca gca cct | 4785 |
| Asp Ile Arg Leu Pro Pro Val Ala Pro Pro Ala Ser Ser Ser Ala Pro | |
| 1285 1290 1295 | |
| aca tca gct cct cca ctg gcc ctg cct gcc tgt cca gac acc atg gtg | 4833 |
| Thr Ser Ala Pro Pro Leu Ala Leu Pro Ala Cys Pro Asp Thr Met Val | |
| 1300 1305 1310 1315 | |
| tcc ctg gtt gtg cct gtc cgt gtt cag acc aat atg ccg tcc tat ggg | 4881 |
| Ser Leu Val Val Pro Val Arg Val Gln Thr Asn Met Pro Ser Tyr Gly | |
| 1320 1325 1330 | |
| agc gca atg tac acc acc ctt tcc cag atc ttg gtc acc cag tcc caa | 4929 |
| Ser Ala Met Tyr Thr Thr Leu Ser Gln Ile Leu Val Thr Gln Ser Gln | |
| 1335 1340 1345 | |
| ggc agc tca gca act gtg gca ctt ccc aag ttt gag gaa ccc cca tca | 4977 |
| Gly Ser Ser Ala Thr Val Ala Leu Pro Lys Phe Glu Glu Pro Pro Ser | |
| 1350 1355 1360 | |
| aag ggg acg act gta tgt ggt gca gat gtg cat gag gtt ggg ccc ggc | 5025 |
| Lys Gly Thr Thr Val Cys Gly Ala Asp Val His Glu Val Gly Pro Gly | |
| 1365 1370 1375 | |
| cct tct ggg tta agt gaa gag caa agc aga gct ttc cca act cca tac | 5073 |
| Pro Ser Gly Leu Ser Glu Glu Gln Ser Arg Ala Phe Pro Thr Pro Tyr | |
| 1380 1385 1390 1395 | |
| ctg aga gtg cct gtg aca tta cct gaa aga aaa ggc act tcc ctg tca | 5121 |
| Leu Arg Val Pro Val Thr Leu Pro Glu Arg Lys Gly Thr Ser Leu Ser | |
| 1400 1405 1410 | |
| tca gag agt atc ttg agc ctg gag ggg agt tca tca aca gca ggg gga | 5169 |
| Ser Glu Ser Ile Leu Ser Leu Glu Gly Ser Ser Ser Thr Ala Gly Gly | |
| 1415 1420 1425 | |
| agc aaa cgt gtc ctt tca cca gct ggc agc ctt gaa ctt acc atg gaa | 5217 |
| Ser Lys Arg Val Leu Ser Pro Ala Gly Ser Leu Glu Leu Thr Met Glu | |
| 1430 1435 1440 | |
| acc cag cag caa aaa aga gtg aag gag gag gag gct tcc aag gca gat | 5265 |
| Thr Gln Gln Lys Arg Val Lys Glu Glu Ala Ser Lys Ala Asp | |
| 1445 1450 1455 | |
| gaa aaa ctt gag ctg gta aaa cca tgc agt gtg gtc ctt acc agc acc | 5313 |
| Glu Lys Leu Glu Leu Val Lys Pro Cys Ser Val Val Leu Thr Ser Thr | |
| 1460 1465 1470 1475 | |
| gag gat ggg aag agg cca gag aaa tcc cac tta ggc aac cag ggc caa | 5361 |
| Glu Asp Gly Lys Arg Pro Glu Lys Ser His Leu Gly Asn Gln Gly Gln | |
| 1480 1485 1490 | |

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|---|------|
| ggc agg agg gag cta gaa atg ctg tcc agc ctg tcc tca gat cca tct | 5409 |
| Gly Arg Arg Glu Leu Glu Met Leu Ser Ser Leu Ser Ser Asp Pro Ser | |
| 1495 1500 1505 | |
| gac aca aag gaa att cct ccc ctc cct cac cct gca ttg tcc cat ggg | 5457 |
| Asp Thr Lys Glu Ile Pro Pro Leu Pro His Pro Ala Leu Ser His Gly | |
| 1510 1515 1520 | |
| caa gcc cca ggc tca gaa gct ttg aag gaa tat ccc cag cca tct ggc | 5505 |
| Gln Ala Pro Gly Ser Glu Ala Leu Lys Glu Tyr Pro Gln Pro Ser Gly | |
| 1525 1530 1535 | |
| aaa cct cac cga aga ggg ttg acc cca ctg agc gtg aag aaa gaa gat | 5553 |
| Lys Pro His Arg Arg Gly Leu Thr Pro Leu Ser Val Lys Lys Glu Asp | |
| 1540 1545 1550 1555 | |
| tcc aag gaa caa cct gat ctc ccc tcc ttg gca cct ccg agc tct ctg | 5601 |
| Ser Lys Glu Gln Pro Asp Leu Pro Ser Leu Ala Pro Pro Ser Ser Leu | |
| 1560 1565 1570 | |
| cct ctg tca gaa acg tcc tcc aga cca gcc aag tca caa gaa ggt acg | 5649 |
| Pro Leu Ser Glu Thr Ser Ser Arg Pro Ala Lys Ser Gln Glu Gly Thr | |
| 1575 1580 1585 | |
| gac tca aag aag gta ctg cag ttc ccc agc ctc cac aca acc act aat | 5697 |
| Asp Ser Lys Lys Val Leu Gln Phe Pro Ser Leu His Thr Thr Thr Asn | |
| 1590 1595 1600 | |
| gtc agt tgg tgc tat tta aac tac att aag cca aat cac atc cag cat | 5745 |
| Val Ser Trp Cys Tyr Leu Asn Tyr Ile Lys Pro Asn His Ile Gln His | |
| 1605 1610 1615 | |
| gca gat agg agg tcc tct gtt tac gct ggt tgg tgc ata agt ttg tac | 5793 |
| Ala Asp Arg Arg Ser Ser Val Tyr Ala Gly Trp Cys Ile Ser Leu Tyr | |
| 1620 1625 1630 1635 | |
| aac ccc aac ctt ccg ggg gtt tcc act aaa gct gct ttg tcc ctc ctg | 5841 |
| Asn Pro Asn Leu Pro Gly Val Ser Thr Lys Ala Ala Leu Ser Leu Leu | |
| 1640 1645 1650 | |
| agg tct aag cag aaa gtg agc aaa gag aca tac acc atg gcc aca gct | 5889 |
| Arg Ser Lys Gln Lys Val Ser Lys Glu Thr Tyr Thr Met Ala Thr Ala | |
| 1655 1660 1665 | |
| ccg cat cct gag gca gga agg ctt gtg cca tcc agc tcc cgc aag ccc | 5937 |
| Pro His Pro Glu Ala Gly Arg Leu Val Pro Ser Ser Arg Lys Pro | |
| 1670 1675 1680 | |
| cgc atg aca gag gtt cac ctc cct tca ctg gtt tcc ccg gaa ggc cag | 5985 |
| Arg Met Thr Glu Val His Leu Pro Ser Leu Val Ser Pro Glu Gly Gln | |
| 1685 1690 1695 | |
| aaa gat cta gct aga gtg gag aag gaa gag agg aga ggg gag ccg | 6033 |
| Lys Asp Leu Ala Arg Val Glu Lys Glu Glu Arg Arg Gly Glu Pro | |
| 1700 1705 1710 1715 | |
| gag gag gat gct cct gcc tcc cag aga ggg gag ccg gcg agg atc aaa | 6081 |
| Glu Glu Asp Ala Pro Ala Ser Gln Arg Gly Glu Pro Ala Arg Ile Lys | |
| 1720 1725 1730 | |

| | |
|---|------|
| atc ttc gaa gga ggg tac aaa tca aac gaa gag tat gta tat gtg cga | 6129 |
| Ile Phe Glu Gly Gly Tyr Lys Ser Asn Glu Glu Tyr Val Tyr Val Arg | |
| 1735 1740 1745 | |
| ggc cgc ggc cga ggg aaa tat gtt tgt gag gag tgt gga att cgc tgc | 6177 |
| Gly Arg Gly Arg Gly Lys Tyr Val Cys Glu Glu Cys Gly Ile Arg Cys | |
| 1750 1755 1760 | |
| aag aag ccc agc atg ctg aag aaa cac atc cgc acc cac act gac gtc | 6225 |
| Lys Lys Pro Ser Met Leu Lys Lys His Ile Arg Thr His Thr Asp Val | |
| 1765 1770 1775 | |
| cgg ccc tat gtg tgc aag cac tgt cac ttt gct ttt aaa acc aaa ggg | 6273 |
| Arg Pro Tyr Val Cys Lys His Cys His Phe Ala Phe Lys Thr Lys Gly | |
| 1780 1785 1790 1795 | |
| aat ctg act aag cac atg aag tcg aag gcc cac agc aaa aag tgc caa | 6321 |
| Asn Leu Thr Lys His Met Lys Ser Lys Ala His Ser Lys Lys Cys Gln | |
| 1800 1805 1810 | |
| gag aca ggg gtg ctg gag gag ctg gaa gcc gaa gga acc agt gac | 6369 |
| Glu Thr Gly Val Leu Glu Leu Glu Ala Glu Glu Gly Thr Ser Asp | |
| 1815 1820 1825 | |
| gac ctg ttc cag gac tcg gaa gga cga gag ggt tca gag gct gtg gag | 6417 |
| Asp Leu Phe Gln Asp Ser Glu Gly Arg Glu Gly Ser Glu Ala Val Glu | |
| 1830 1835 1840 | |
| gag cac cag ttt tcg gac ctg gag gac tcg gac tca gac tca gac ctg | 6465 |
| Glu His Gln Phe Ser Asp Leu Glu Asp Ser Asp Ser Asp Ser Asp Leu | |
| 1845 1850 1855 | |
| gac gaa gac gag gat gag gat gag gag gag agc cag gat gag ctg tcc | 6513 |
| Asp Glu Asp Glu Asp Glu Glu Ser Gln Asp Glu Leu Ser | |
| 1860 1865 1870 1875 | |
| aga cca tcc tca gag gcg ccc ccg cct ggc cca cca cat gca ctg cgg | 6561 |
| Arg Pro Ser Ser Glu Ala Pro Pro Gly Pro Pro His Ala Leu Arg | |
| 1880 1885 1890 | |
| gca gac tcc tca ccc atc ctg ggc cct cag ccc cca gat gcc ccc gcc | 6609 |
| Ala Asp Ser Ser Pro Ile Leu Gly Pro Gln Pro Pro Asp Ala Pro Ala | |
| 1895 1900 1905 | |
| tct ggc acg gag gcc aca cga ggc agc tcg gtc tcg gaa gct gag cgc | 6657 |
| Ser Gly Thr Glu Ala Thr Arg Gly Ser Ser Val Ser Glu Ala Glu Arg | |
| 1910 1915 1920 | |
| ctg aca gcc agc agc tgc tcc atg tcc agc cag agc atg ccg ggc ctc | 6705 |
| Leu Thr Ala Ser Ser Cys Ser Met Ser Ser Gln Ser Met Pro Gly Leu | |
| 1925 1930 1935 | |
| ccc tgg ctg gga ccg gcc cct ctg ggc tct gtg gag aaa gac aca ggc | 6753 |
| Pro Trp Leu Gly Pro Ala Pro Leu Gly Ser Val Glu Lys Asp Thr Gly | |
| 1940 1945 1950 1955 | |
| tca gcc ttg agc tac aag cct gtg tcc cca aga aga ccg tgg tcc cca | 6801 |
| Ser Ala Leu Ser Tyr Lys Pro Val Ser Pro Arg Arg Pro Trp Ser Pro | |
| 1960 1965 1970 | |

| | |
|---|------|
| agc aaa gaa gca ggc agc cgt cca cca cta gcc cgc aaa cac tcg cta | 6849 |
| Ser Lys Glu Ala Gly Ser Arg Pro Pro Leu Ala Arg Lys His Ser Leu | |
| 1975 1980 1985 | |
| acc aaa aac gac tca tct ccc cag cga tgc tcc ccg gcc cga gaa cca | 6897 |
| Thr Lys Asn Asp Ser Ser Pro Gln Arg Cys Ser Pro Ala Arg Glu Pro | |
| 1990 1995 2000 | |
| cag gcc tca gcc cca agc cca cct ggc ctg cac gtg gac cca gga agg | 6945 |
| Gln Ala Ser Ala Pro Ser Pro Pro Gly Leu His Val Asp Pro Gly Arg | |
| 2005 2010 2015 | |
| ggc atg ggc cct ctc cct tgt ggg tct cca aga ctt cag ctg tct cct | 6993 |
| Gly Met Gly Pro Leu Pro Cys Gly Ser Pro Arg Leu Gln Leu Ser Pro | |
| 2020 2025 2030 2035 | |
| ctc acc ctc tgc ccc ctg gga aga gaa ctg gcc cct cga gca cat gtg | 7041 |
| Leu Thr Leu Cys Pro Leu Gly Arg Glu Leu Ala Pro Arg Ala His Val | |
| 2040 2045 2050 | |
| ctc tcc aaa ctc gag ggt acc acc gac cca ggc ctc ccc aga tac tcg | 7089 |
| Leu Ser Lys Leu Glu Gly Thr Thr Asp Pro Gly Leu Pro Arg Tyr Ser | |
| 2055 2060 2065 | |
| ccc acc agg aga tgg tct cca ggt cag gcc gag tca cca cca cgg tca | 7137 |
| Pro Thr Arg Arg Trp Ser Pro Gly Gln Ala Glu Ser Pro Pro Arg Ser | |
| 2070 2075 2080 | |
| gcg ccg cca ggg aag tgg gcc ttg gct ggg ccg ggc agc ccc tca gcg | 7185 |
| Ala Pro Pro Gly Lys Trp Ala Leu Ala Gly Pro Gly Ser Pro Ser Ala | |
| 2085 2090 2095 | |
| ggg gag cat ggc cca ggc ttg ggg ctg gcc cca cgg gtt ctc ttc ccg | 7233 |
| Gly Glu His Gly Pro Gly Leu Gly Leu Ala Pro Arg Val Leu Phe Pro | |
| 2100 2105 2110 2115 | |
| ccc gcg cct cta cct cac aag ctc ctc agc aga agc cca gag acc tgc | 7281 |
| Pro Ala Pro Leu Pro His Lys Leu Leu Ser Arg Ser Pro Glu Thr Cys | |
| 2120 2125 2130 | |
| gcc tcc ccg tgg cag aag gcc gag tcc cga agt ccc tcc tgc tca ccc | 7329 |
| Ala Ser Pro Trp Gln Lys Ala Glu Ser Arg Ser Pro Ser Cys Ser Pro | |
| 2135 2140 2145 | |
| ggc cct gct cat cct ctc tcc cga ccc ttc tcc gcc ctc cat gac | 7377 |
| Gly Pro Ala His Pro Leu Ser Ser Arg Pro Phe Ser Ala Leu His Asp | |
| 2150 2155 2160 | |
| ttc cac ggc cac atc ctg gcc cgg aca gag gag aac atc ttc agc cac | 7425 |
| Phe His Gly His Ile Leu Ala Arg Thr Glu Glu Asn Ile Phe Ser His | |
| 2165 2170 2175 | |
| ctg cct ctg cac tcc cag cac ttg acc cgt gcc cca tgt ccc ttg att | 7473 |
| Leu Pro Leu His Ser Gln His Leu Thr Arg Ala Pro Cys Pro Leu Ile | |
| 2180 2185 2190 2195 | |
| ccc atc ggt ggg atc cag atg gtg cag gcc cgg cca gga gcc cac ccc | 7521 |
| Pro Ile Gly Gly Ile Gln Met Val Gln Ala Arg Pro Gly Ala His Pro | |
| 2200 2205 2210 | |

| | |
|---|------|
| acc ctg ctg cca ggg ccc acc gca gcc tgg gtc agt ggc ttc tcc ggg | 7569 |
| Thr Leu Leu Pro Gly Pro Thr Ala Ala Trp Val Ser Gly Phe Ser Gly | |
| 2215 2220 2225 | |
| ggt ggc agc gac ctg aca ggg gcc cggt gag gcc cag gag cga ggc cgc | 7617 |
| Gly Gly Ser Asp Leu Thr Gly Ala Arg Glu Ala Gln Glu Arg Gly Arg | |
| 2230 2235 2240 | |
| tgg agt ccc act gag agc tcg tca gcc tcc gtg tcg cct gtg gct aag | 7665 |
| Trp Ser Pro Thr Glu Ser Ser Ala Ser Val Ser Pro Val Ala Lys | |
| 2245 2250 2255 | |
| gtc tcc aaa ttc aca ctc tcc tca gag ctg gag ggc agg gac tac ccc | 7713 |
| Val Ser Lys Phe Thr Leu Ser Ser Glu Leu Glu Gly Arg Asp Tyr Pro | |
| 2260 2265 2270 2275 | |
| aag gag agg gag agg acc ggc gga ggc ccc agg cct cct gac tgg | 7761 |
| Lys Glu Arg Glu Arg Thr Gly Gly Pro Gly Arg Pro Pro Asp Trp | |
| 2280 2285 2290 | |
| aca ccc cat ggg acc ggg gca cct gca gag ccc aca ccc acg cac agc | 7809 |
| Thr Pro His Gly Thr Gly Ala Pro Ala Glu Pro Thr Pro Thr His Ser | |
| 2295 2300 2305 | |
| ccc tgc acc cca ccc gac acc ttg ccc cgg ccc cag gga cgc cgg | 7857 |
| Pro Cys Thr Pro Pro Asp Thr Leu Pro Arg Pro Pro Gln Gly Arg Arg | |
| 2310 2315 2320 | |
| gca gcg cag tcc tgg agc ccc cgc ttg gag tcc ccc cgt gca ccc gcc | 7905 |
| Ala Ala Gln Ser Trp Ser Pro Arg Leu Glu Ser Pro Arg Ala Pro Ala | |
| 2325 2330 2335 | |
| aac ccc gag cct tct gcc acc ccc cgt gac cgc agc agc tct gtg | 7953 |
| Asn Pro Glu Pro Ser Ala Thr Pro Pro Leu Asp Arg Ser Ser Ser Val | |
| 2340 2345 2350 2355 | |
| ggc tgc ctg gca gag gcc tct gcc cgc ttc cca gcc cgg acg agg aac | 8001 |
| Gly Cys Leu Ala Glu Ala Ser Ala Arg Phe Pro Ala Arg Thr Arg Asn | |
| 2360 2365 2370 | |
| ctc tcc ggg gaa tcc agg acc agg cag gac tcc ccc aag ccc tca gga | 8049 |
| Leu Ser Gly Glu Ser Arg Thr Arg Gln Asp Ser Pro Lys Pro Ser Gly | |
| 2375 2380 2385 | |
| agt ggg gag ccc agg gca cat cca cat cag cct gag gac agg gtt ccc | 8097 |
| Ser Gly Glu Pro Arg Ala His Pro His Gln Pro Glu Asp Arg Val Pro | |
| 2390 2395 2400 | |
| ccc aac gct tagcctctct ccaactgctt cagcatctgg cttccagtgt | 8146 |
| Pro Asn Ala | |
| 2405 | |
| ccagcaacag acgtttccag ccactttcct cgaatcatcc cacttcctca gccccatctg | 8206 |
| tccctccatc caggagctct cacggcccca tctgttgcac cttccatgt atgcagttac | 8266 |
| ctgtgcctt ttctacacct ttgttgctt aaaaagaaac aaaaacaatc acatacatac | 8326 |
| attnaaaaaa aaaacaacaa cccacgagga gtctgaggct gtgaatagtt tatggttttg | 8386 |
| gggaaaggct gatggtaag ctcctgacc ctcccgctg tgggtggcag ccacccaccc | 8446 |
| cagaggctgg cagaggaaaa ggggtacact gagggagaaa ggaaaaggaa acttcaaaca | 8506 |
| atataagaatt aaatgtaaaaa ggcagcactc ctgtgtacag | 8546 |

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 35 40 45
 Pro Ala Gln Glu Leu Leu Ala Pro Gln Pro Phe Pro Gly Pro Ser Ser
 50 55 60
 Val Leu Arg Glu Gly Ser Gln Glu Lys Thr Gly Gln Gln Gln Lys Pro
 65 70 75 80
 Pro Lys Arg Pro Pro Ile Glu Ala Ser Val His Ile Ser His Val Pro
 85 90 95
 Gln His Pro Leu Thr Pro Ala Phe Met Ser Pro Gly Lys Pro Glu His
 100 105 110
 Leu Leu Glu Gly Ser Thr Trp Gln Leu Val Ser Pro Met Arg Leu Gly
 115 120 125
 Pro Ser Gly Ser Leu Leu Ala Pro Gly Leu His Pro Gln Ser Gln Leu
 130 135 140
 Leu Pro Ser His Ala Ser Ile Ile Pro Pro Glu Asp Leu Pro Gly Val
 145 150 155 160
 Pro Lys Val Phe Val Pro Arg Pro Ser Gln Val Ser Leu Lys Pro Thr
 165 170 175
 Glu Glu Ala His Lys Lys Glu Arg Lys Pro Gln Lys Pro Gly Lys Tyr
 180 185 190
 Ile Cys Gln Tyr Cys Ser Arg Pro Cys Ala Lys Pro Ser Val Leu Gln
 195 200 205
 Lys His Ile Arg Ser His Thr Gly Glu Arg Pro Tyr Pro Cys Gly Pro
 210 215 220
 Cys Gly Phe Ser Phe Lys Thr Lys Ser Asn Leu Tyr Lys His Arg Lys
 225 230 235 240
 Ser His Ala His Arg Ile Lys Ala Gly Leu Ala Ser Gly Met Gly Gly
 245 250 255
 Glu Met Tyr Pro His Gly Leu Glu Met Glu Arg Ile Pro Gly Glu Glu
 260 265 270
 Phe Glu Glu Pro Thr Glu Gly Glu Ser Thr Asp Ser Glu Glu Glu Thr
 275 280 285
 Ser Ala Thr Ser Gly His Pro Ala Glu Leu Ser Pro Arg Pro Lys Gln
 290 295 300
 Pro Leu Leu Ser Ser Gly Leu Tyr Ser Ser Gly Ser His Ser Ser Ser
 305 310 315 320
 His Glu Arg Cys Ser Leu Ser Gln Ser Ser Thr Ala Gln Ser Leu Glu
 325 330 335
 Asp Pro Pro Pro Phe Val Glu Pro Ser Ser Glu His Pro Leu Ser His
 340 345 350
 Lys Pro Glu Asp Thr His Thr Ile Lys Gln Lys Leu Ala Leu Arg Leu
 355 360 365
 Ser Glu Arg Lys Lys Val Ile Asp Glu Gln Ala Phe Leu Ser Pro Gly
 370 375 380
 Ser Lys Gly Ser Thr Glu Ser Gly Tyr Phe Ser Arg Ser Glu Ser Ala
 385 390 395 400
 Glu Gln Gln Val Ser Pro Pro Asn Thr Asn Ala Lys Ser Tyr Ala Glu
 405 410 415
 Ile Ile Phe Gly Lys Cys Gly Arg Ile Gly Gln Arg Thr Ala Met Leu
 420 425 430

Thr Ala Thr Ser Thr Gln Pro Leu Leu Pro Leu Ser Thr Glu Asp Lys
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 Pro Ser Leu Val Pro Leu Ser Val Pro Arg Thr Gln Val Ile Glu His
 450 455 460
 Ile Thr Lys Leu Ile Thr Ile Asn Glu Ala Val Val Asp Thr Ser Glu
 465 470 475 480
 Ile Asp Ser Val Lys Pro Arg Arg Ser Ser Leu Ser Arg Arg Ser Ser
 485 490 495
 Met Glu Ser Pro Lys Ser Ser Leu Tyr Arg Glu Pro Leu Ser Ser His
 500 505 510
 Ser Glu Lys Thr Lys Pro Glu Gln Ser Leu Leu Ser Leu Gln His Pro
 515 520 525
 Pro Ser Thr Ala Pro Pro Val Pro Leu Leu Arg Ser His Ser Met Pro
 530 535 540
 Ser Ala Ala Cys Thr Ile Ser Thr Pro His His Pro Phe Arg Gly Ser
 545 550 555 560
 Tyr Ser Phe Asp Asp His Ile Thr Asp Ser Glu Ala Leu Ser Arg Ser
 565 570 575
 Ser His Val Phe Thr Ser His Pro Arg Met Leu Lys Pro Gln Pro Ala
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 Ile Glu Leu Pro Leu Gly Glu Tyr Ser Ser Glu Glu Pro Gly Pro
 595 600 605
 Ser Ser Lys Asp Thr Ala Ser Lys Pro Ser Asp Glu Val Glu Pro Lys
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 Glu Ser Glu Leu Thr Lys Lys Thr Lys Lys Gly Leu Lys Thr Lys Gly
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 Val Ile Tyr Glu Cys Asn Ile Cys Gly Ala Arg Tyr Lys Lys Arg Asp
 645 650 655
 Asn Tyr Glu Ala His Lys Lys Tyr Tyr Cys Ser Glu Leu Gln Ile Ala
 660 665 670
 Lys Pro Ile Ser Ala Gly Thr His Thr Ser Pro Glu Ala Glu Lys Ser
 675 680 685
 Gln Ile Glu His Glu Pro Trp Ser Gln Met Met His Tyr Lys Leu Gly
 690 695 700
 Thr Thr Leu Glu Leu Thr Pro Leu Arg Lys Arg Arg Lys Glu Lys Ser
 705 710 715 720
 Leu Gly Asp Glu Glu Pro Pro Ala Phe Glu Ser Thr Lys Ser Gln
 725 730 735
 Phe Gly Ser Pro Gly Pro Ser Asp Ala Ala Arg Asn Leu Pro Leu Glu
 740 745 750
 Ser Thr Lys Ser Pro Ala Glu Pro Ser Lys Ser Val Pro Ser Leu Glu
 755 760 765
 Gly Pro Thr Gly Phe Gln Pro Arg Thr Pro Lys Pro Gly Ser Gly Ser
 770 775 780
 Glu Ser Gly Lys Glu Arg Arg Thr Thr Ser Lys Glu Ile Ser Val Ile
 785 790 795 800
 Gln His Thr Ser Ser Phe Glu Lys Ser Asp Ser Leu Glu Gln Pro Ser
 805 810 815
 Gly Leu Glu Gly Glu Asp Lys Pro Leu Ala Gln Phe Pro Ser Pro Pro
 820 825 830
 Pro Ala Pro His Gly Arg Ser Ala His Ser Leu Gln Pro Lys Leu Val
 835 840 845
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 850 855 860
 Asp Arg Pro Asp Thr Glu Pro Glu Pro Pro Lys Glu Pro Glu Lys
 865 870 875 880
 Thr Glu Glu Phe Gln Trp Pro Gln Arg Ser Gln Thr Leu Ala Gln Leu
 885 890 895
 Pro Ala Glu Lys Ala Pro Pro Lys Lys Lys Arg Leu Arg Leu Ala Glu
 900 905 910

Met Ala Gln Ser Ser Gly Glu Ser Ser Phe Glu Ser Ser Val Pro Leu
 915 920 925
 Ser Arg Ser Pro Ser Gln Glu Ser Asn Val Ser Leu Ser Gly Ser Ser
 930 935 940
 Arg Ser Ala Ser Phe Glu Arg Asp Asp His Gly Lys Ala Glu Ala Pro
 945 950 955 960
 Asp Pro Ser Ser Asp Met Arg Pro Lys Pro Leu Gly Thr His Met Leu
 965 970 975
 Thr Val Pro Ser His His Pro His Ala Arg Glu Met Arg Arg Ser Ala
 980 985 990
 Ser Glu Gln Ser Pro Asn Val Ser His Ser Ala His Met Thr Glu Thr
 995 1000 1005
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 1060 1065 1070
 Gln Pro Ser Ser Ser Lys Pro Ser Ala Lys Ser Ser Leu Ser Gln Ile
 1075 1080 1085
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 Leu Gln Val Phe His His Pro Val Ala Gln Thr Pro Leu His Glu Lys
 1125 1130 1135
 Pro Tyr Leu Pro Pro Pro Val Ser Leu Phe Ser Phe Gln His Leu Val
 1140 1145 1150
 Gln His Glu Pro Gly Gln Ser Pro Glu Phe Phe Ser Thr Gln Ala Met
 1155 1160 1165
 Ser Ser Leu Leu Ser Ser Pro Tyr Ser Met Pro Pro Leu Pro Pro Ser
 1170 1175 1180
 Leu Phe Gln Ala Pro Pro Leu Pro Leu Gln Pro Thr Val Leu His Pro
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 Gly Gln Leu His Leu Pro Gln Leu Met Pro His Pro Ala Asn Ile Pro
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Thr Pro Tyr Leu Arg Val Pro Val Thr Leu Pro Glu Arg Lys Gly Thr
 1395 1400 1405
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 1445 1450 1455
 Lys Ala Asp Glu Lys Leu Glu Leu Val Lys Pro Cys Ser Val Val Leu
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 Thr Ser Thr Glu Asp Gly Lys Arg Pro Glu Lys Ser His Leu Gly Asn
 1475 1480 1485
 Gln Gly Gln Gly Arg Arg Glu Leu Glu Met Leu Ser Ser Leu Ser Ser
 1490 1495 1500
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 Ser His Gly Gln Ala Pro Gly Ser Glu Ala Leu Lys Glu Tyr Pro Gln
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 1585 1590 1595 1600
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 Tyr Val Arg Gly Arg Gly Lys Tyr Val Cys Glu Glu Cys Gly
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 1780 1785 1790
 Thr Lys Gly Asn Leu Thr Lys His Met Lys Ser Lys Ala His Ser Lys
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 Lys Cys Gln Glu Thr Gly Val Leu Glu Glu Leu Glu Ala Glu Glu Gly
 1810 1815 1820
 Thr Ser Asp Asp Leu Phe Gln Asp Ser Glu Gly Arg Glu Gly Ser Glu
 1825 1830 1835 1840
 Ala Val Glu Glu His Gln Phe Ser Asp Leu Glu Asp Ser Asp Ser Asp
 1845 1850 1855

 Ser Asp Leu Asp Glu Asp Glu Asp Glu Asp Glu Glu Ser Gln Asp
 1860 1865 1870

Glu Leu Ser Arg Pro Ser Ser Glu Ala Pro Pro Pro Gly Pro Pro His
 1875 1880 1885
 Ala Leu Arg Ala Asp Ser Ser Pro Ile Leu Gly Pro Gln Pro Pro Asp
 1890 1895 1900
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 1905 1910 1915 1920
 Ala Glu Arg Leu Thr Ala Ser Ser Cys Ser Met Ser Ser Gln Ser Met
 1925 1930 1935
 Pro Gly Leu Pro Trp Leu Gly Pro Ala Pro Leu Gly Ser Val Glu Lys
 1940 1945 1950
 Asp Thr Gly Ser Ala Leu Ser Tyr Lys Pro Val Ser Pro Arg Arg Pro
 1955 1960 1965
 Trp Ser Pro Ser Lys Glu Ala Gly Ser Arg Pro Pro Leu Ala Arg Lys
 1970 1975 1980
 His Ser Leu Thr Lys Asn Asp Ser Ser Pro Gln Arg Cys Ser Pro Ala
 1985 1990 1995 2000
 Arg Glu Pro Gln Ala Ser Ala Pro Ser Pro Pro Gly Leu His Val Asp
 2005 2010 2015
 Pro Gly Arg Gly Met Gly Pro Leu Pro Cys Gly Ser Pro Arg Leu Gln
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 Thr His Ser Pro Cys Thr Pro Pro Asp Thr Leu Pro Arg Pro Pro Gln
 2305 2310 2315 2320
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 2405

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20

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21

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22

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22

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 Ser Gly Met Gly Gly Glu Met Tyr Pro His Gly Leu Glu Met Glu Arg
 50 55 60
 Ile Pro Gly Glu Glu Phe Glu Glu Pro Thr Glu Gly Glu Ser Thr Asp
 65 70 75 80
 Ser Glu Glu Glu Thr Ser Ala Thr Ser Gly His Pro Ala Glu Leu Ser
 85 90 95
 Pro Arg Pro Lys Gln Pro Leu Leu Ser Ser Gly Leu Tyr Ser Ser Gly
 100 105 110
 Ser His Ser Ser His Glu Arg Cys Ser Leu Ser Gln Ser Ser Thr
 115 120 125
 Ala Gln Ser Leu Glu Asp Pro Pro Pro Phe Val Glu Pro Ser Ser Glu
 130 135 140
 His Pro Leu Ser His Lys Pro Glu Asp Thr His Thr Ile Lys Gln Lys
 145 150 155 160
 Leu Ala Leu Arg Leu Ser Glu Arg Lys Lys Val Ile Asp Glu Gln Ala
 165 170 175
 Phe Leu Ser Pro Gly Ser Lys Gly Ser Thr Glu Ser Gly Tyr Phe Ser
 180 185 190
 Arg Ser Glu Ser Ala Glu Gln Gln Val Ser Pro Pro Asn Thr Asn Ala
 195 200 205
 Lys Ser Tyr Ala Glu Ile Ile Phe Gly Lys Cys Gly Arg Ile Gly Gln
 210 215 220
 Arg Thr Ala Met Leu Thr Ala Thr Ser Thr Gln Pro Leu Leu Pro Leu
 225 230 235 240
 Ser Thr Glu Asp Lys Pro Ser Leu Val Pro Leu Ser Val Pro Arg Thr
 245 250 255
 Gln Val Ile Glu His Ile Thr Lys Leu Ile Thr Ile Asn Glu Ala Val
 260 265 270
 Val Asp Thr Ser Glu Ile Asp Ser Val Lys Pro Arg Arg Ser Ser Leu
 275 280 285
 Ser Arg Arg Ser Ser Met Glu Ser Pro Lys Ser Ser Leu Tyr Arg Glu
 290 295 300
 Pro Leu Ser Ser His Ser Glu Lys Thr Lys Pro Glu Gln Ser Leu Leu
 305 310 315 320
 Ser Leu Gln His Pro Pro Ser Thr Ala Pro Pro Val Pro Leu Leu Arg
 325 330 335
 Ser His Ser Met Pro Ser Ala Ala Cys Thr Ile Ser Thr Pro His His
 340 345 350
 Pro Phe Arg Gly Ser Tyr Ser Phe Asp Asp His Ile Thr Asp Ser Glu
 355 360 365
 Ala Leu Ser Arg Ser Ser His Val Phe Thr Ser His Pro Arg Met Leu
 370 375 380
 Lys Pro Gln Pro Ala Ile Glu Leu Pro Leu Gly Gly Glu Tyr Ser Ser
 385 390 395 400
 Glu Glu Pro Gly Pro Ser Ser Lys Asp Thr Ala Ser Lys Pro Ser Asp
 405 410 415
 Glu Val Glu Pro Lys Glu Ser Glu Leu Thr Lys Lys Thr Lys Lys Gly
 420 425 430
 Leu Lys Thr Lys Gly Val Ile Tyr Glu Cys Asn Ile Cys Gly Ala Arg
 435 440 445
 Tyr Lys Lys Arg Asp Asn Tyr Glu Ala His Lys Lys Tyr Tyr Cys Ser
 450 455 460
 Glu Leu Gln Ile Ala Lys Pro Ile Ser Ala Gly Thr His Thr Ser Pro
 465 470 475 480

Glu Ala Glu Lys Ser Gln Ile Glu His Glu Pro Trp Ser Gln Met Met
 485 490 495
 His Tyr Lys Leu Gly Thr Thr Leu Glu Leu Thr Pro Leu Arg Lys Arg
 500 505 510
 Arg Lys Glu Lys Ser Leu Gly Asp Glu Glu Glu Pro Pro Ala Phe Glu
 515 520 525
 Ser Thr Lys Ser Gln Phe Gly Ser Pro Gly Pro Ser Asp Ala Ala Arg
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 Asn Leu Pro Leu Glu Ser Thr Lys Ser Pro Ala Glu Pro Ser Lys Ser
 545 550 555 560
 Val Pro Ser Leu Glu Gly Pro Thr Gly Phe Gln Pro Arg Thr Pro Lys
 565 570 575
 Pro Gly Ser Gly Ser Glu Ser Gly Lys Glu Arg Arg Thr Thr Ser Lys
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 Glu Ile Ser Val Ile Gln His Thr Ser Ser Phe Glu Lys Ser Asp Ser
 595 600 605
 Leu Glu Gln Pro Ser Gly Leu Glu Gly Glu Asp Lys Pro Leu Ala Gln
 610 615 620
 Phe Pro Ser Pro Pro Ala Pro His Gly Arg Ser Ala His Ser Leu
 625 630 635 640
 Gln Pro Lys Leu Val Arg Gln Pro Asn Ile Gln Val Pro Glu Ile Leu
 645 650 655
 Val Thr Glu Glu Pro Asp Arg Pro Asp Thr Glu Pro Glu Pro Pro Pro
 660 665 670
 Lys Glu Pro Glu Lys Thr Glu Glu Phe Gln Trp Pro Gln Arg Ser Gln
 675 680 685
 Thr Leu Ala Gln Leu Pro Ala Glu Lys Ala Pro Pro Lys Lys Lys Arg
 690 695 700
 Leu Arg Leu Ala Glu Met Ala Gln Ser Ser Gly Glu Ser Ser Phe Glu
 705 710 715 720
 Ser Ser Val Pro Leu Ser Arg Ser Pro Ser Gln Glu Ser Asn Val Ser
 725 730 735
 Leu Ser Gly Ser Ser Arg Ser Ala Ser Phe Glu Arg Asp Asp His Gly
 740 745 750
 Lys Ala Glu Ala Pro Asp Pro Ser Ser Asp Met Arg Pro Lys Pro Leu
 755 760 765
 Gly Thr His Met Leu Thr Val Pro Ser His His Pro His Ala Arg Glu
 770 775 780
 Met Arg Arg Ser Ala Ser Glu Gln Ser Pro Asn Val Ser His Ser Ala
 785 790 795 800
 His Met Thr Glu Thr Arg Ser Lys Ser Phe Asp Tyr Gly Ser Leu Ser
 805 810 815
 Leu Thr Gly Pro Ser Ala Pro Ala Pro Val Ala Pro Pro Ala Gly Glu
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 Ser Arg Pro Pro
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 <212> PRT
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<400> 8
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 35 40 45
 Gly Leu Thr Pro Leu Ser Val Lys Lys Glu Asp Ser Lys Glu Gln Pro
 50 55 60
 Asp Leu Pro Ser Leu Ala Pro Pro Ser Ser Leu Pro Leu Ser Glu Thr
 65 70 75 80
 Ser Ser Arg Pro Ala Lys Ser Gln Glu Gly Thr Asp Ser Lys Lys Val
 85 90 95
 Leu Gln Phe Pro Ser Leu His Thr Thr Asn Val Ser Trp Cys Tyr
 100 105 110
 Leu Asn Tyr Ile Lys Pro Asn His Ile Gln His Ala Asp Arg Arg Ser
 115 120 125
 Ser Val Tyr Ala Gly Trp Cys Ile Ser Leu Tyr Asn Pro Asn Leu Pro
 130 135 140
 Gly Val Ser Thr Lys Ala Ala Leu Ser Leu Leu Arg Ser Lys Gln Lys
 145 150 155 160
 Val Ser Lys Glu Thr Tyr Thr Met Ala Thr Ala Pro His Pro Glu Ala
 165 170 175
 Gly Arg Leu Val Pro Ser Ser Arg Lys Pro Arg Met Thr Glu Val
 180 185 190
 His Leu Pro Ser Leu Val Ser Pro Glu Gly Gln Lys Asp Leu Ala Arg
 195 200 205
 Val Glu Lys Glu Glu Glu Arg Arg Gly Glu Pro Glu Glu Asp Ala Pro
 210 215 220
 Ala Ser Gln Arg Gly Glu Pro Ala Arg Ile Lys Ile Phe Glu Gly Gly
 225 230 235 240
 Tyr Lys Ser Asn Glu Glu Tyr Val Tyr Val Arg Gly Arg Gly Arg Gly
 245 250 255
 Lys Tyr Val Cys Glu Glu Cys Gly Ile Arg Cys Lys Lys Pro Ser Met
 260 265 270
 Leu Lys Lys His Ile Arg Thr His Thr Asp Val Arg Pro Tyr Val Cys
 275 280 285
 Lys His Cys His Phe Ala Phe Lys Thr Lys Gly Asn Leu Thr Lys His
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 Met Lys Ser Lys Ala His Ser Lys Lys Cys Gln Glu Thr Gly Val Leu
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 Glu Glu Leu Glu Ala Glu Glu Gly Thr Ser Asp Asp Leu Phe Gln Asp
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 Ser Glu Gly Arg Glu Gly Ser Glu Ala Val Glu Glu His Gln Phe Ser
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 Asp Leu Glu Asp Ser Asp Ser Asp Leu Asp Glu Asp Glu Asp
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 Glu Asp Glu Glu Glu Ser Gln Asp Glu Leu Ser Arg Pro Ser Ser Glu
 370 375 380
 Ala Pro Pro Pro Gly Pro Pro His Ala Leu Arg Ala Asp Ser Ser Pro
 385 390 395 400
 Ile Leu Gly Pro Gln Pro Pro Asp Ala Pro Ala Ser Gly Thr Glu Ala
 405 410 415
 Thr Arg Gly Ser Ser Val Ser Glu Ala Glu Arg Leu Thr Ala Ser Ser
 420 425 430
 Cys Ser Met Ser Ser Gln Ser Met Pro Gly Leu Pro Trp Leu Gly Pro
 435 440 445
 Ala Pro Leu Gly Ser Val Glu Lys Asp Thr Gly Ser Ala Leu Ser Tyr
 450 455 460
 Lys Pro Val Ser Pro Arg Arg Pro Trp Ser Pro Ser Lys Glu Ala Gly
 465 470 475 480
 Ser Arg Pro Pro Leu Ala Arg Lys His Ser Leu Thr Lys Asn Asp Ser
 485 490 495
 Ser Pro Gln Arg Cys Ser Pro Ala Arg Glu Pro Gln Ala Ser Ala Pro
 500 505 510

Ser Pro Pro Gly Leu His Val Asp Pro Gly Arg Gly Met Gly Pro Leu
515 520 525
Pro Cys Gly Ser Pro Arg Leu Gln Leu Ser Pro Leu Thr Leu Cys Pro
530 535 540
Leu Gly Arg Glu Leu Ala Pro Arg Ala His Val Leu Ser Lys Leu Glu
545 550 555 560
Gly Thr Thr Asp Pro Gly Leu Pro Arg Tyr Ser Pro Thr Arg Arg Trp
565 570 575
Ser Pro Gly Gln Ala Glu Ser Pro Pro Arg Ser Ala Pro Pro Gly Lys
580 585 590
Trp Ala Leu Ala Gly Pro Gly Ser Pro Ser Ala Gly Glu His Gly Pro
595 600 605
Gly Leu Gly Leu Ala Pro Arg Val Leu Phe Pro Pro Ala Pro Leu Pro
610 615 620
His Lys Leu Leu Ser Arg Ser Pro Glu Thr Cys Ala Ser Pro Trp Gln
625 630 635 640
Lys Ala Glu Ser Arg Ser Pro Ser Cys Ser Pro Gly Pro Ala His Pro
645 650 655
Leu Ser Ser Arg Pro Phe Ser Ala Leu His Asp Phe His Gly His Ile
660 665 670
Leu Ala Arg Thr Glu Glu Asn Ile Phe Ser His Leu Pro Leu His Ser
675 680 685
Gln His Leu Thr Arg Ala Pro Cys Pro Leu Ile Pro Ile Gly Gly Ile
690 695 700
Gln Met Val Gln Ala Arg Pro Gly Ala His Pro Thr Leu Leu Pro Gly
705 710 715 720
Pro Thr Ala Ala Trp Val Ser Gly Phe Ser Gly Gly Ser Asp Leu
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Thr Gly Ala Arg Glu Ala Gln Glu Arg Gly Arg Trp Ser Pro Thr Glu
740 745 750
Ser Ser Ser Ala Ser Val Ser Pro Val Ala Lys Val Ser Lys Phe Thr
755 760 765
Leu Ser Ser Glu Leu Glu Gly Arg Asp Tyr Pro Lys Glu Arg Glu Arg
770 775 780
Thr Gly
785